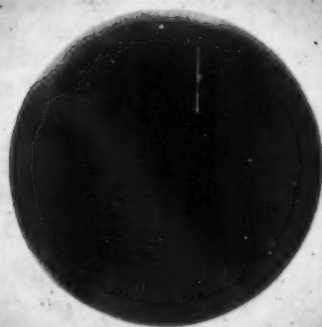


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# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • MAY 31, 1947



Total Eclipse

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A SCIENCE SERVICE PUBLICATION

## PSYCHIATRY

## New Shock Treatment

A new kind of electric shock through the brain cures many of mental diseases. The throb of current is very brief and memory is not lost.

► MEN AND WOMEN living shut away from reality in a world of diseased fancy, or suffering from the despair of extreme depression are now being restored to mental health by a new kind of electric shock through the brain.

Success with the new treatment for some of the most common types of mental sickness, such as schizophrenia and manic-depressive psychosis, was reported to the American Psychiatric Association independently by Dr. W. T. Liberson, of the Institute of Living, Hartford, Conn., who developed the treatment, and Dr. Douglas Goldman, of Longview State Hospital, Cincinnati.

Secret of the success of the new treatment is that the electricity is regulated so that each throb of the alternating current is extremely brief—only about one half of one thousandth of a second. In the ordinary house current previously used for the electric shock treatment, the pulse of current lasts from eight to 16 thousandths of a second. The new method uses what is believed to be the time that will affect the nerve with the smallest amount of electric power.

Because each throb of the current is so very brief, the treatment can be kept

up for a longer time without damage to the brain cells through which it passes.

Both old and new methods produce a convulsion similar in appearance to an epileptic fit. But with the new method, the convulsion lasts longer. It is less severe, Dr. Liberson reported. Patients are able to get up after the treatment and walk out of the room without confusion, walking steadily.

Out of 46 patients who had only this type of treatment, 25 recovered and another four improved.

Chief advantage of this new "brief stimulus" treatment is that it avoids loss of memory or other mental damage, Dr. Liberson said. But this is in a way also a disadvantage, for some patients—lacking the complete forgetfulness of the treatment that characterizes those taking the older form of electric shock—develop a vivid antipathy to the therapy. This can be reduced, he explained, by using a sedative drug before the shock.

The new method is especially valuable for old people who need many treatments, Dr. Goldman told the meeting. Dr. Goldman used the new therapy on 125 patients with very favorable results.

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## PSYCHIATRY

## Drug Helps Some Epilepsy

► NEW HOPE for children suffering from two serious disabling diseases is offered by the new drug, tridione, Dr. Eugene Davidoff, assistant director of Craig Colony, Sonyea, N. Y., reported to the meeting of the American Psychiatric Association in New York. He has been trying the drug on 75 patients.

Children stumbling about with the clumsy trembling movements often due to injuries to the brain at birth, are quieted down and enabled to move more normally. The drug works for about 65% of these cases known to the doctor as "spastic cerebral palsies of the milder type."

Those with "petit mal epilepsy," in which they lose consciousness very briefly, perhaps falling down and picking

themselves up again many times in the same day, are helped in about 60 cases out of 100.

These two diseases which keep thousands of children out of school or tied to a wheel chair have been fairly hopeless in the past.

The new drug is not so successful with the more severe type of "fits" which the doctor calls "grand mal epilepsy." Only 30% of those cases were helped, Dr. Davidoff found.

Reduction in the number of attacks was not always accompanied by an improvement in the pattern of electric signals which doctors can pick up from the brain cells. Only half of the 75 patients had a better brain wave pattern after treatment with tridione, it was found.

In about one case out of five, the drug had some poisonous effects, Dr. Davidoff found. These toxic effects can be kept at a minimum, he said, by careful regulation of the dose and by watching the patient in a clinic or hospital. About 10 or 15 persons out of each hundred cannot tolerate the drug.

Both the toxic effects and the changes in brain wave pattern are aids in estimating the effects of the drug and the type of patient who should be given it.

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## MEDICINE

## Two New Chemicals Keep Chiggers Away Pleasantly

► YOU DON'T have to go around smelling of sulfur to keep the chiggers away any more. Two new and pleasanter anti-chigger chemicals are benzyl benzoate and dimethyl phthalate. This latter is the more practical from the standpoint of availability, a husband and wife team of entomologists, Mary H. and Charles D. Michener, report in the current issue of *Natural History*.

Dimethyl phthalate kills chiggers quickly and is found in some of the newer commercial brands of mosquito repellents. You can apply it to your skin, but its effectiveness wears off in four or five hours. For an all day hike through regions likely to abound in chiggers, it is more practical to apply it from the mouth of a small bottle around the tops of boots or socks, waistband, shirt front, cuffs and any other edges of openings in your clothes. This forces the chigger to cross the treated line in order to get inside your clothes and attack you. Still better protection comes from spraying the chemical on your clothes or dipping them into a water emulsion of it. Benzyl benzoate, if you can get it, can be applied in the same way.

Chiggers should not be confused with jiggers or chigoes. These are small fleas which burrow into the skin. Chiggers are mites and they do not burrow. Neither do they suck blood. They inject a digestive fluid into you to dissolve the tissues so they can suck them up. Your skin reacts to this by hardening the cells on all sides of the path of the potent juice. A tubule or sort of miniature well is formed which is often as deep as the chigger is long. The liquefied tissue is contained within the hardened walls. Probably the action of the digestive fluid is what makes the bite itch.

*Science News Letter, May 31, 1947*

## MEDICINE

# Test KR for Cancer Here

The Russian anti-cancer endotoxin is being tested in the U. S. on mice. Material for humans is not yet in sight. Results encourage further research.

► THE WIDELY heralded Soviet KR cancer endotoxin is being tested in the United States.

All U. S. tests so far are on mice. Any treatment of human patients is "not yet in sight."

Dr. Theodore S. Hauschka, of Lankenau Hospital's Institute for Cancer Research in Philadelphia, reported the first tests to the American Association for Cancer Research.

He told the scientists that the results with mice are sufficiently encouraging to warrant further intensive work on the problem.

He said that every letter he gets from a patient or a physician asking for some of the material will delay still further the day when trials on humans might be made. He works without a secretary. Every time a letter comes, he must stop working on the anti-cancer serum to type the answer.

He works across the street from the hospital, in a house so old that the city of Philadelphia had condemned it. The hospital renovated it for Dr. Hauschka's laboratory, partly to give him more space and partly to safeguard patients and the hospital's mouse colony from the germs of deadly Chagas' disease.

## Germs Produce Material

These germs, called *Trypanosoma cruzi* or *T. cruzi* for short, produce the anti-cancer material discovered by the Soviet scientists, Dr. Gregory Roskin and his wife, Dr. Nina Klyueva. This anti-cancer material is called an endotoxin. It is neither a serum nor, strictly speaking, a vaccine. It is obtained from the blood plasma of mice that have the germs in their bodies.

The growth of cancers in mice can be slowed and occasionally the cancers can be completely abolished in mice infected with *T. cruzi*. But since the disease is sometimes fatal to humans, it is not practical to give the germs to the humans. What is given is the endotoxin the germs produce, which is free of all the outer shell of the germs and which does not cause Chagas' disease.

This material produced softening and

partial destruction of cancers in Dr. Hauschka's mice, just as the Soviet scientists reported. But the mice themselves died of liver and kidney damage.

This is one reason Dr. Hauschka says "No" to all requests for material to be given to patients. The U. S. material is not yet safe to use.

Second reason why the material is a long way from being ready for trials on human patients is the difficulty of getting enough of it. This is also an important reason why the Soviet scientists were not able to send samples to American scientists for testing.

## Made from Blood Plasma

The material has to be made from the blood plasma of infected mice. A mouse does not have very much blood in its body. All the blood you can get from a single mouse makes only one unit of KR anti-cancer material. One of the four patients successfully treated in Russia got 7,750 units over 69 days.

At that rate, there isn't a breeding establishment in the country that could raise enough mice to make material for treating all the cancer patients. And it would take the full time of one technician for every patient to infect the mice, bleed them and process the material. The mice have to be bled at exactly the right stage of the infection. That means injecting the germs into mice every day, keeping a series of them going, so as to have material for treatment every day.

If you wonder how the Russians were able to get material for treating patients, part of the answer is that they have only treated 57 patients and have been working on the method since 1939.

Of these 57, only four have been successfully treated. In these four, three men and a woman, the cancers went away. But it is only about a year (11 months when the report was received in this country) since the first patient was "cured." And as even the layman knows, cancer cannot be called cured until at least five years have elapsed without a return of symptoms.

It takes a special strain of the Chagas' disease germ to produce the anti-cancer

material. Dr. Hauschka has been working with several different strains. His latest tests were made with the same one, called the R. strain, the Soviets used.

Miss E. M. Johnson, trypanosome expert of the U. S. National Institute of Health, flew to England last February to get it for Dr. Hauschka from the Wellcome Laboratories of Tropical Medicine. Dr. Cecil A. Hoare there has kept the R. strain going in mice since 1936. It was first cultured 10 years earlier by Dr. Reichenow in Hamburg, Germany.

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## NUCLEAR PHYSICS

## Electron Beam Made Visible by Its Own Light

► VISIBLE LIGHT is given off from moving electrons in a new atom-smashing machine, and the electron beam has been made visible by its own light, General Electric engineers have revealed.

This is believed to be the first time this effect has been observed, Dr. C. G. Suits, G. E. director of research, states. The observations were made in the 70,000,000-volt synchrotron, a new type of atom smasher built for the U. S. Naval Research Laboratory.

Electrons are electrical particles bearing negative electrical charges. According to the electron theory all matter consists



**ELECTRON LIGHT**—The spot of light in the center is the radiation directly from the electron beam inside a 70,000,000-volt synchrotron's vacuum tube. The horizontal line of light is caused by reflections and other distortions produced by the glass walls.



of atoms with a positive nucleus, electrically, and a number of negative electrons which may be detached under certain conditions, leaving the atom positively charged. The electron tube, of types similar to those used in radio, emits electrons. The atom-smashers, synchrotron, betatron and cyclotron, emit electrons in powerful beams.

The observations of visible light from the electron beams in the new synchrotron were made by G. E. scientists from behind a protecting concrete wall by means of a mirror. Because of the dangerous X-rays emitted by the atom-smasher, it is not possible to approach close to the machine while it is in operation.

They observed inside the doughnut-shaped vacuum tube in which the electrons circle, a brilliant bluish-white spot

appear. This is from light beamed forward from the electrons, tangent to their circular orbit.

Emission of light from the electron stream is similar to radiation of radio waves from a transmitting station, Dr. Suits explained. In the antenna, electrons oscillate rapidly to and fro between metal atoms. As they are speeded up and slowed down, their energy is converted into electromagnetic waves.

No electron light was ever observed from the 100,000,000-volt betatron built by General Electric because its doughnut is lined with silver that makes it opaque. The synchrotron, however, is lined with a transparent layer which is electrically conducting like the silver and carries away unwanted electrical charges as they accumulate.

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#### ASTRONOMY

## Sun Eclipse Magnificent

The expedition was 80% successful and many plates and films will give scientific information. Large groups of glowing prominences were visible.

See Front Cover

By JAMES STOKLEY

► THE GAMBLE made by the Army Air Forces and the National Geographic Society when they sent an elaborate expedition to observe the total eclipse of the sun from a remote spot in the interior of Brazil paid off with nearly complete success.

The expedition was 80% successful, according to the preliminary estimate of Dr. Lyman J. Briggs, former director of the National Bureau of Standards and scientific leader of the party. But many plates and films are still undeveloped and months will be required before they can be fully analyzed.

Aside from scientific value, this eclipse was as magnificent a spectacle as any of the five eclipses I have seen.

During the three minutes and 48 seconds of the total eclipse, I had ample chance to study the solar corona through my binoculars. As predicted by astronomer U. S. Lyons of the U. S. Naval Observatory, there were large groups of prominences or flame-like clouds of glowing gas visible on both the upper and lower edges of the sun.

A full view of the sun, showing the corona at the time of totality, is pictured on the cover of this SCIENCE NEWS

#### LETTER.

Because we were in the tropics, the moon moved across the sun almost vertically from top to bottom. Just after totality commenced, the corona flashed out the brilliant pinkish prominences seen on the lower or eastern edge. The moving moon covered this before totality ended, but exposed the other group above.

I saw one streamer that extended for perhaps twice the sun's diameter to the north. Many shorter streamers appeared, especially curved ones extending from near the sun's poles during totality.

Venus and Mars shone above the sun, Mercury below, Sirius off to the right.

With the eclipse over, both scientists and soldiers made preparations to leave. In a few weeks, cattle of Joao Antonio de Sigueria will be contentedly grazing among concrete piers and brick and cement tent platforms, which the expedition will leave behind. Bocayuvans will have a legend about the strange Americanos who came for such a curious reason, bringing the town prosperity.

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Florida's *poinciana* is thought to have come from seed brought by chance from the Old World on a slave ship during colonial days.

#### PHYSICS

## Probe-Like Rod Is Surgical Extractor for Steel Bits

► A SURGICAL instrument for the easier extraction of iron and steel fragments from both military and industrial wounds is offered by a Michigan inventor, Raymond A. Mull, for patent 2,420,004. It consists of a probe-like rod, over which an electric coil can be slipped after it has made contact with the fragment. Converted thus into a powerful magnet, it withdraws the fragment from the wound, minimizing the amount of cutting necessary.

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Aluminum bows for archers are reliable because not affected by weather.

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## MEDICINE

# Relief for Childbirth Pain

**Benzedrine, used for keeping awake, kills pain and stimulates breathing. It increases the pain-killing effect of morphine when used with it.**

*Reports on the meeting of the Federation of American Societies for Experimental Biology are presented on the following pages and throughout this issue.*

► **NEWEST DRUG** being tried for relief of pain in childbirth is the chemical in the "pep pills" college students used to take to keep them awake while cramming for exams.

The chemical is known both as benzedrine and amphetamine. Its successful use for relief of childbirth pains was announced by Drs. Stuart Abel and Stanley C. Harris, Northwestern University Medical School, at the meeting in Chicago of the Federation of American Societies for Experimental Biology.

Benzedrine's pain-relieving ability has not been as widely known as its anti-sleepiness quality. It not only relieves pain but increases the pain-killing effect of morphine. When both benzedrine and morphine are given, the pain-killing effect is greater than would be expected by adding the separate effects of the two drugs.

Equally important, benzedrine stimulates breathing. These two effects were what led the Northwestern doctors to try it for relief of childbirth pains.

Babies whose mothers got benzedrine

with morphine during the first stage of childbirth began to breathe within 42 seconds, on the average, after their chins were out in the air. They cried and had good color and did not need artificial respiration.

Many doctors have favored morphine over all other drugs for relieving childbirth pains, but it had the dangerous disadvantage of slowing the breath in the baby. If the results in the 15 cases reported are duplicated, the combination of the two drugs may come into wide use. The Northwestern scientists are also trying benzedrine for relief of pain in the last stages of cancer and find it successful.

New knowledge of how morphine acts to kill pain comes from rat experiments reported by Dr. Harris and Dr. Frances J. Friend of Northwestern.

Everyone is familiar with the fact that when a person is excited, he does not feel pain. This is due to the action of adrenalin, or epinephrine, produced by the adrenal glands in dangerous situations or under conditions of extreme stress and strain.

Morphine, Drs. Harris and Friend discovered, relieves pain by causing the adrenal glands to produce adrenalin.

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be possible to give it to the patients in capsules which they can swallow without tasting the chemical inside.

This chemical not only darkens potatoes; it plays a part in the production of the black dye, melanin, which is responsible for the dark color in some human skins. Leukemia patients who have been temporarily helped by X-ray or arsenic treatment have their skins turn darker. This suggested to Dr. Isaacs the idea of giving the patients the chemical that causes the change in skin color.

Leukemia patients have too many white cells in their blood. In the acute form, there are too many immature, or young, white cells. In the chronic form of leukemia there are more mature, or ripe, white blood cells. The potato and skin-darkening chemical given to acute leukemia patients cuts down the number of immature white cells in their blood, making them ripen into grown-up white cells. But they still have too many white cells and the fundamental disease is still present. Next step for scientists is to attack the fundamental trouble in the hope of finding a cure.

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## BIOCHEMISTRY

## Drink Coffee Black If You Want Energy

► **DRINK YOUR** coffee black and without sugar if you are taking it to pep up for increased activity. And, in reverse, if coffee makes you jittery, drink it sweetened or eat sweets with it.

These suggestions should work if humans react as rats do to the caffeine of coffee with and without sugar. Caffeine without sugar increased the spontaneous activity of white rats, Drs. John Haldi, Winfrey Winn and Charles Ensor, of Emory University, reported at the meeting in Chicago of the Federation of American Societies for Experimental Biology.

Sugar neutralized the action of the caffeine to a large extent. So did peptone and vegetable oil.

Why this is so the scientists have so far not been able to find out. It is not because of the mere presence of other substances besides caffeine and water in the stomach nor because the other substances interfered with the absorption of the caffeine. Half an hour after the caffeine was given, and after it had been absorbed and produced the increase in activity, sugar neutralized the effect.

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## MEDICINE

# Chemical for Leukemia

► **NEW HOPE** for patients threatened with death from leukemia comes from a chemical that turns potatoes black. Eleven patients with acute leukemia, destined to die within a few weeks, have had their lives prolonged by this potato-blackening chemical for months and maybe years.

The chemical, called tyrosinase, is not a cure. It is considered a step forward on the path toward conquest of this cancer-like disease of the blood and blood-forming organs.

Its role in helping leukemia patients was announced by Dr. Raphael Isaacs of Michael Reese Hospital at the meet-

ing in Chicago of the Federation of American Societies for Experimental Biology.

The chemical turns the acute form of leukemia into the chronic form. It is the first substance found that will do this. Most patients with acute leukemia die within six weeks. Patients with chronic leukemia may live for one or two years or more. And there is always the hope that while they are being kept alive by the chemical treatment some permanent cure might be discovered.

The chemical is taken by mouth three times a day. It has a rather unpleasant taste, but Dr. Isaacs hopes it soon will

## MEDICINE

# Deadly Chain Reaction

Spreading of disease is a chain reaction as dangerous as that which makes the atomic bomb and can be used as a weapon.

► A DEADLY CHAIN reaction as dangerous as that which makes the atom bomb was dramatized in the unofficial Smyth report on germ warfare released by the American Association of Scientific Workers at the meeting of the Federation of American Societies for Experimental Biology in Chicago.

This chain reaction is what makes it so hard to stop an epidemic of flu or measles or any other disease caught from germs in the air. The chain reaction means that an enemy would not need a very large quantity of germs to cause great havoc.

A man in a factory coming down with some deadly disease spreads millions of its tiny invisible germs in the air of the plant with every breath exhaled from his lungs. These germs do not fall to the ground and die. They remain alive in the air for hours, existing in an invisible mist.

All the other workers in the plant will draw some of them into their bodies with each breath they take. Then they get sick, but the general reaction of the germs doesn't stop there. Each of these persons in turn becomes a new link in the chain. Each one becomes a small germ factory, breathing more germs into his body and exhaling them with every breath.

This chain reaction was described in connection with the way measles spreads in schools by Dr. Wm. F. Wells of the University of Pennsylvania School of Medicine recently.

If the germs were of a rare disease or one uncommon in our own country, our doctors might not recognize it at first. They might not know how to treat it or even how it spreads. Other members of the family, nurses, doctors themselves, might all come down with it before anyone realized how deadly and how contagious it was.

That happened at the start of the war when a strange eye disease hit workers in shipyards and war plants. The disease looked like a bad case of ordinary pink-eye. Patients caught it in their doctors' offices and tens of thousands were sick with it and even temporarily blinded

before the nature of the disease was discovered. The disease became known as "shipyard eye."

Need for the War Department to publish an official Smyth report on germ warfare like the famous report of the atomic bomb was stressed at a meeting by the American Association of Scientific Workers. They have just published the unofficial report on germ warfare in the *Journal of Immunology*.

A brewery in any small country could be a germ warfare arsenal in disguise. Distilleries in the United States turned their fermentation processes to growing the molds that produced penicillin and streptomycin. In the same way, harmless-looking breweries and distilleries could turn secretly to mass production of deadly germs.

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## NUCLEAR PHYSICS

## Device Records Radiation In Millionth of Second

► EVENTS in the explosion of an atom in creating atomic energy that occur as close together as a millionth of a second can now be detected and recorded.

A new instrument to help in the job of applying atomic power to useful work is responsible. It was revealed at the Mid-America Exposition atomic energy show by Westinghouse Electric Corporation. It is claimed to be far more sensitive than the Geiger counter long used to detect and count radioactive particles.

The new device is still in an experimental stage, but in its present form can give a clear count of individual rays up to 100,000 a second. It has a speed 50 times greater than the standard Geiger counter, Westinghouse scientists declare.

Heart of the new detector, developed by Dr. Fitz-Hugh Marshall and Dr. John W. Coltman, is a small phototube with a fluorescent screen and a mirror attached. When atomic radiation hits the screen, it releases a flood of light rays or photons. These are collected by the mirror and focussed on a light-sensitive surface in the phototube, shaking loose thousands of electrons from that surface.



**RADIATION DETECTOR**—This "atomic ray detector" counts radiations from exploding atoms at the rate of 100,000 each second.

These freed electrons, which are negatively charged electrical particles, collide with another sensitive plate in the phototube, knocking loose still more electrons. The process is repeated nine times. The flow of electrons, or electrical current, by then is amplified about a million times.

This signal can be transmitted to the fluorescent screen of a cathode-ray oscilloscope where observers can see the atomic explosions as flashing peaks of light. The signal can also be transmitted to electronic circuits which record the number of atomic particles being radiated.

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## CHEMISTRY

## Quinoline Used in Oil Well To Open Water-Clogging

► QUINOLINE or a related amine, dissolved in oil, is pumped down into oil wells dropping in yield because of water-clogged sands. The amines render the sand more wettable by oil, thus restoring the flow. The patent, No. 2,419,755, was granted to F. W. Albaugh of Inglewood, Calif., and assigned to the Union Oil Company of California.

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Bald eagles are said to be fond of fish but are poor fishermen; they hang around good fishers, such as fish hawks, and take their catches away from them.



## AERONAUTICS

**Navy Banshee Fighter Completes Flight Tests**

► THE BANSHEE will soon join its brother, the Phantom. Both are jet-propelled Navy fighter planes designed to operate from carrier vessels, and both are built by the McDonnell Aircraft Corporation. The Banshee has just finished flight tests; the Phantom is in production.

The Banshee is described as the most powerful single-seat fighter flown in the United States today. It is in the 600-mile-per-hour class, and can climb at a rate of 9,000 feet per minute. It is powered with a pair of Westinghouse slim, axial-flow, turbo-jet engines, and can operate on either one or both of them.

These engines put at the command of the pilot of the Banshee more power than is found in any other fighter plane, officials of the U. S. Navy declare. They are designated the Yankee 24C, to indicate American origin and diameter in inches. The Phantom is powered with Westinghouse Yankee 19XB. In both engines, the air enters the front and leaves the rear in the propulsion jet without its direction of flow being changed. This is the feature that makes this engine the "axial-flow" type.

The Banshee will be known in the Navy as the XF2D-1. Its stub-end wings spread 41 feet when open and 18 feet when folded for storage on deck. The length of the plane is 39 feet. The pilot's head is above the body of the plane, covered by a flattish dome of transparent material that gives him a view in every direction. He is protected from gun-fire with armor plate, and the windshield is bullet-resisting. The engines snuggle close to the fuselage, which makes it easier to keep on course when only one is operating.

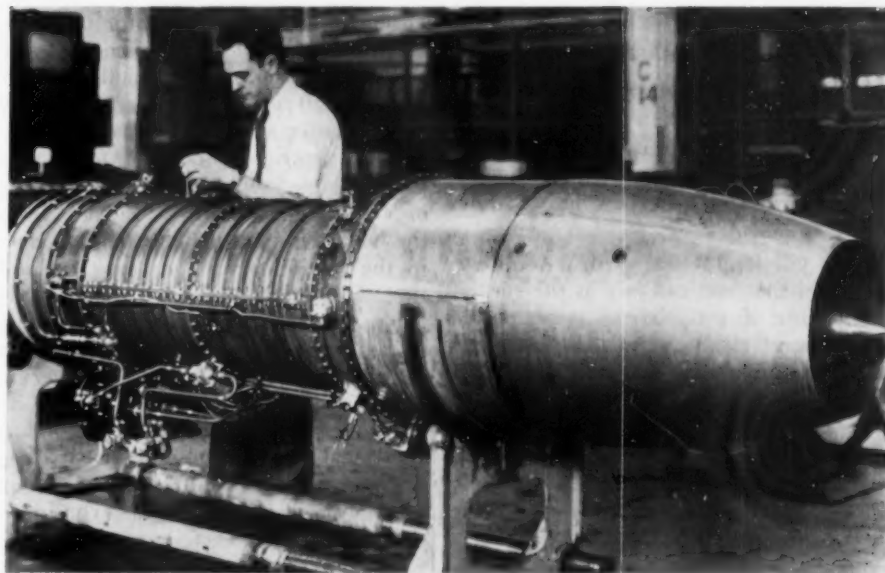
*Science News Letter, May 31, 1947*

## CHEMISTRY

**Silicate Glass of Lead Used to Flameproof Fabric**

► A NEW METHOD for flameproofing fabric by impregnating it with a silicate glass of lead or other metal is submitted by L. C. Athy and P. C. Stuft of Baltimore for patent 2,420,644, which they assign to the Pemco Corporation. At flame temperatures the glass melts, protecting the fibers.

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**"YANKEE"**—Two of these turbo-jet engines are mounted in the Navy Banshee, most powerful carrier-based fighter plane in the world.

## MEDICINE

**Muscle Disease Treatment**

This treatment makes muscles afflicted with tired muscle disease respond like normal muscles to an electrical stimulus.

► PATIENTS suffering from tired muscle disease called myasthenia gravis may be able to use their muscles more if they get a sort of beefsteak by vein treatment.

This is suggested by experiments reported by Drs. Clara Torda and Harold G. Wolff of New York Hospital and Cornell Medical College at the meeting of the Federation of American Societies for Experimental Biology.

They gave amino acids, the chemical building blocks of proteins such as meat, milk and eggs, in a solution with sugar to very sick myasthenia gravis patients and to healthy persons. After the injection, the tired muscles of the patients responded like those of healthy persons to an electrical stimulus to the nerve controlling the muscle tested.

The idea for trying this treatment came from a new explanation of why patients with this disease cannot make their muscles work. The explanation involves a nerve chemical called acetylcholine.

When a nerve is stimulated to move a muscle, this chemical is released at the end of the nerve where it joins the muscle. The chemical may be what car-

ries the nerve message over into the muscle to make it move or work.

Patients with myasthenia gravis, according to the new theory, do not synthesize, or produce, enough of the nerve chemical. That is thought to be the reason they cannot make their muscles work to chew, raise their eyelids, swallow and perform other work.

Test tube experiments showed that the protein-building amino acids increased synthesis of acetylcholine, the nerve chemical.

The doctors are now trying to find whether this is the explanation, or whether the amino acids help because the patients were not getting enough of them or because these acids detoxify some unknown poison that may be causing the trouble.

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Fumigation of soil in large fields to destroy the tiny *nematode* worms that are destructive to crop roots is accomplished by injecting into the soil chemical preparations of chlorine or bromine at depths of six to eight inches.

## PSYCHOLOGY

**Pill Three Times a Day  
Makes Children Brighter**

► NOW A CHILD can take a pill three times a day and grow more intelligent. But if he takes an overdose he will lose sleep.

The pill is glutamic acid, a common chemical that you can buy at the corner drug store if you have a prescription. It is one of the amino acids which are the building blocks of proteins such as you get from meat.

In an experiment, 30 children were given the acid. After a year of treatment they had gained up to 17 points in intelligence quotient and their mental age had gone up two years.

The improvement affects not only intelligence but personality, the meeting in New York of the American Psychiatric Association learned from the experimenters, Dr. Frederic T. Zimmerman, Miss Bessie B. Burgemeister and Dr. Tracy J. Putnam of Columbia University. The children got along better with others after the treatment.

If a child is not bright even after he has taken the acid for a year he might just as well give it up anyway. The greatest improvement, the researchers found, takes place in the first six months. By the end of a year the ceiling of improvement seems to be reached.

Only one of the 30 patients treated failed to get brighter. At the beginning 21 were mentally backward.

*Science News Letter, May 31, 1947*

## MEDICINE

**Pinch of Soda Is  
Good for Athletes**

► A PINCH of bicarbonate of soda may some day be used to improve the performance of athletes and others engaged in tasks requiring physical exercise.

This possibility has been brought to light by research at the University of California, where Dr. William E. Berg has developed a new technique of measuring physical fitness. The technique may also be useful in studying and diagnosing circulatory diseases.

It is based on the physiological reactions in exercise. During exercise the body consumes an increased amount of oxygen, and as a result builds up a surplus of carbon dioxide as a waste product.

Dr. Berg found that the rate at which the body can rid itself of this waste

carbon dioxide is an indicator of physical fitness and of the efficiency of the circulatory system. Age is another factor. A man of 20 rids himself of excess carbon dioxide twice as fast as a man of 60.

In his experiments Dr. Berg found that bicarbonate of soda can increase the rate of elimination of carbon dioxide from the body. He said that this work is only in the preliminary stage, however, and that considerable research must be done before the correct amounts of bicarbonate of soda can be determined. Too much bicarbonate of soda can make a person ill.

Dr. Berg adapted the thermal conductivity analyzer, used in industrial analyses of gases, to the measurement of carbon dioxide eliminated and oxygen consumed during and after exercise.

A subject breathes into a mask while taking stepping-up exercises. A tube leading from the mask carries samples of air to the thermal conductivity analyzer where both oxygen consumed and carbon dioxide exhaled are measured.

*Science News Letter, May 31, 1947*

## NUTRITION

**Good Diet Helps Increase  
Pneumonia Susceptibility**

► THE ANSWER to why robust, healthy men often get pneumonia may come from discovery of a new relation between diet and disease announced at the meeting in Chicago of the Federation of American Societies for Experimental Biology.

A good diet contains a substance which actually makes mice more susceptible to pneumonia, Drs. George A. Hitchings and Elvira A. Falco, of the Wellcome Research Laboratories at Tuckahoe, N. Y., reported.

A person who eats a good diet that builds up his own resistance may also be taking into his body something which nourishes the pneumonia germs even more than it nourishes him, is a possible explanation of the new finding.

The pneumonia-nourishing substance has not yet been identified. It is found in peanuts, navy beans, oats and wheat. It is present in both the bran and germ of wheat but there is not very much in white flour. It could not be found in liver or yeast, which are rich sources of B vitamins, nor in corn meal or milk powder.

Since the findings were on mice and pneumonia germs only, scientists are not yet ready to advise humans to apply the finding to their own diets.

*Science News Letter, May 31, 1947*

**IN SCIENCE**

## MEDICINE

**Cancer-Causing Virus  
In Milk Believed Isolated**

► THE ACTUAL chemical in mother's milk that causes breast cancer in mice has been isolated, it appears from an announcement at the meeting in Chicago of the American Association for Cancer Research.

The announcement was cautiously worded but the studies are said to "provide substantial hope that the virus has been isolated."

The work was done by Drs. Samuel Graff, biochemist, C. D. Haagensen, surgeon, Dan H. Moore, physicist, and Henry T. Randall, surgeon, of Columbia University and Dr. Wendell M. Stanley, Rockefeller Institute virus researcher and Nobel Prize winner.

"Certified" mouse milk from a mouse dairy atop a New York skyscraper was treated by the modern tools with which chemists take protein molecules apart to get the cancer-causing agent.

*Science News Letter, May 31, 1947*

## ORNITHOLOGY

**Bluejays Getting Used  
To Their Human Neighbors**

► BLUEJAYS have apparently decided that since they can't scold human beings off the premises they might as well settle down and be neighborly. At any rate, these big, bold, strikingly-marked birds, once exceedingly man-shy, have during the past half-century or so taken to staying in the neighborhood of houses, even fearlessly coming up to the doors. This change in bluejay habits is noted in a study by Dr. W. M. Tyler in a new publication of the Smithsonian Institution, one of a series on bird life histories.

Although most people who have heard bluejays "sound off" would be hard to convince, these usually raucously noisy birds can also sing. They seem to be quite shy about it, like "tough guys" indulging in lyric poetry. But once in a while a jay will see! the seclusion of the woods, or hide in a thick evergreen, and pour forth a solo of "faint whistles and low, sweet notes, some in phrasing and pitch suggesting a robin's song."

*Science News Letter, May 31, 1947*



# THE FIELDS

## INVENTION

## Electric Stall Kills Mice And Throws Them Out

► IF THERE is any truth in that old saying about better mouse-traps, the world should presently be beating a path to the door of H. L. Ratchford of Muncie, Ind., to get his electric one. It is a kind of miniature stall, with metallic contact plates on its floor and sides, a bait-holder at the end, and a cable to plug into the house circuit. When the mouse seeks the bait he comes in contact with the plates and is electrocuted. The last convulsive jerk of his muscles throws him out of the trap, leaving it ready for the next mouse. Patent 2,420,723 has been granted on this invention.

*Science News Letter, May 31, 1947*

## CHEMISTRY

## Neutron Bombardment Gives New Isotope of Hafnium

► NEUTRON bombardment of hafnium has produced a new isotope of that element, according to Dr. A. H. W. Aten, Jr., of Eindhoven, the Netherlands.

The creation of this new form of matter was originally published by the author in a Dutch language journal during the recent war, and he now has reported his discovery to *Science* (April 11).

The artificially created radioactive hafnium isotope, announced by Dr. Aten, has atomic weight 175 and a half-life period of 10 minutes. It is found in hafnium material which has been irradiated with fast neutrons, and the author suggests its use in analyzing minerals containing both hafnium and its related element, zirconium, to measure the hafnium present.

Fast neutron bombardment produces in addition material with radioactivity measured in periods of six hours, and another kind measured at 20 seconds. The 20-second kind has been reported also by Dr. A. Flammersfeld in a German journal, according to Dr. Aten, but it is made by a different process. Slow neutrons produce this 20-second isomer exclusively.

Hafnium of weight 175 fills a gap in

the list of isotopes of that element, whose previously known and stable forms have weights of 174, 176, 177, 178, 179 and 180.

Neutron bombardment is a method being widely investigated by scientists for production of new isotopes of the elements. Each isotope has its own period and type of radioactive decay, so that it has distinct individuality. Hafnium belongs to the group of elements intermediate in weight between the heavy ones like uranium, in which neutron bombardment may produce fission, and the light ones like hydrogen and helium, whose atomic disintegration sustains the heat of the sun and stars. Its middle-of-the-road position is assurance that there is no immediate danger of hafnium bombs.

*Science News Letter, May 31, 1947*

## PHYSICS

## Umpire Cuts Off Remarks By Raising Right Foot

► "YEROUT!" will resound into the farthest bleachers, in the umpire's own tones of doom.

And if the enraged batter turns round and blares "WHAAT?!!" into the umpire's face-mask, the stands may hear that, too. But delicate ears will be spared the subsequent colloquy, if the umpire raises his right foot. Not necessarily for the immediate physical disciplining of the protesting player, but merely to break his circuit that ends up in the ballpark's loudspeakers.

This situation can be expected to become commonplace if an invention on which U. S. patent 2,420,461 has been granted to Charles H. Capp of Philadelphia finds its way into general use.

The design calls for a small microphone to be mounted inside the mask, right in front of the official's mouth. A pair of wires runs under his clothing and down one pants leg, to a pair of stud-like terminals held in place under the arch of his foot by a harness around his instep and heel. In the normal position for his right foot, behind the plate, is a sunken block containing contacts for his foot-borne terminals. A cable leads back to the amplifying system.

So long as he stands in his usual place, peering over the catcher's head, the stands hear 'em as he calls 'em. If for any reason he steps off his contact-block, his voice loses its Doomsday thunder.

*Science News Letter, May 31, 1947*

## AERONAUTICS

## Inventors Attack Problem Of Easier Helicopter Flying

► MAKING HELICOPTERS easier to fly is engaging the attention of numerous engineers and inventors. The problem is tackled in three quite different ways by three men to whom patents have been issued by the U. S. Patent Office.

The design on which A. E. Larsen of Jenkinstown, Pa., obtained patent 2,420,784 calls for either one or two small horizontal propellers as part of his craft's tail assembly, to maintain horizontal stability. Beneath them are grilles containing adjustable vanes like the slats of a Venetian blind. These are to overcome the torque effect, or the tendency of the helicopter's body to slew around in a direction opposite to that of the rotor. His patent is assigned to the Glenn L. Martin Company.

R. R. Hays of Lawrence, Kans., tackles the torque problem partly by having a smaller, counter-rotating rotor with trailing flaps mounted directly beneath the main rotor, partly by surfaces set at an angle on the tail vudder. The former functions during the beginning of flight, the latter after the machine has picked up speed. The patent number is 2,420,823.

W. L. Raschke of Fort Worth, Texas, has taken out patent 2,420,796 on a craft with two oppositely turning rotors on laterally projecting booms. These can be tilted to increase speed in forward flight, and the booms themselves can be shifted forward for climbing or backward for nosing downward.

*Science News Letter, May 31, 1947*

## CHEMISTRY

## Benzol Used to Toughen Rubber from Goldenrod

► THE END of the war has brought a slackening of interest in goldenrod rubber; but we may have to face a rubber crisis again some day, so F. L. McKennon of New Orleans and J. R. Lindquist of Los Angeles have developed a method for toughening up the soft, tacky rubber of this plant. The rubber and the customary compounding vulcanizing chemicals are mixed after dissolving in benzol; then the benzol is rapidly evaporated out and the rubber mixture heated. Rights in the patent, No. 2,420,788, are assigned royalty-free to the government.

*Science News Letter, May 31, 1947*

ASTRONOMY

# Jupiter Brightest Planet

In the southern part of the sky, Jupiter will be the brightest object in the heavens except the moon. Saturn and Mercury will be visible.

By JAMES STOKLEY

► **STANDING** in the south in the constellation of Libra, the scales, the planet Jupiter is the brightest object (except the moon, of course) to be seen on June evenings. With magnitude minus two on the astronomer's scale of brilliance, it is about 19 times as bright as the two first magnitude stars nearby—Spica, in Virgo, the virgin, to the right, and Antares, in Scorpio, the scorpion, to the left. Still higher, in Bootes, the bear-driver, is Arcturus, more brilliant, but Jupiter exceeds this by about eight times.

The positions of these stars, and the planets, are shown on the accompanying maps, which display the skies as they appear about 11:00 p. m., your own brand of daylight saving time, or 10:00 p. m., by standard time, at the first of the month. They have a similar appearance an hour earlier in the middle of June.

## Saturn Can Be Seen

Besides Jupiter, Saturn can also be seen, another member of the sun's family of planets which shines, unlike the stars, by reflected sunlight. In brightness between Arcturus and Spica, it is in the west in the constellation of Cancer, the crab, a group between Leo, the Lion, and Gemini, the twins. Saturn sets about three hours after the sun.

In the middle of the month Mercury, innermost planet, is a little to the south of Castor and Pollux, in Gemini, which are shown on the maps in the northwest. On the 17th, Mercury, farthest east of the sun, sets the longest time after sunset. Even then, however, it goes down before twilight is ended. Its magnitude is about the same as that of Saturn, but it will not look as bright on account of its low altitude.

In addition to those already mentioned, several first magnitude stars are also visible. Brightest is Vega, in Lyra, the lyre, high in the east. Below this group we see Cygnus, the swan, with the star Deneb marking the bird's tail. To the right of Cygnus is a small faint constellation, Sagitta, the arrow, and to the

right of that is Aquila, the eagle, with first magnitude Altair. Still another star of this rating finds a place on the maps—Capella, in Auriga, the charioteer, close to the northern horizon. Like Mercury, its lowness makes it look very dim.

Two additional planets, completing the list of the five that are visible without optical aid, appear in the morning skies. Mars, still quite faint because of its distance, is in Aries, the ram and rises a couple of hours before the sun. Venus, much brighter, exceeding even Jupiter, is in Taurus, the bull, and appears low in the east at sunrise.

## Partial Lunar Eclipse

On May 20, as the moon came between the sun and earth, the passage of the lunar shadow across our planet produced a total solar eclipse, visible in Brazil and Africa. About two weeks later, on June 3, the moon has swung around to the opposite direction from the earth and is still close enough to the plane in which the earth goes around the sun to enter partly into our shadow. Thus, there is a partial lunar eclipse, not visible from North America, but visible generally in the eastern hemisphere. It is not a very good eclipse, for at its greatest, the earth's shadow covers only a little more than two per cent of the moon's diameter, which will produce a little darkening on the satellite's northern edge.

In June we see best all that is visible in these latitudes of Centaurus, the centaur. It is shown near the horizon, direct-

ly south. In this constellation is the star that is nearest to our solar system—alpha Centauri. Not for thousands of years will this be visible from as far north as New York or Chicago. Now, if you want to see it, you have to go south of latitude 30 degrees north. Thus, this month, it is visible to people in southern Florida. Alpha Centauri's distance is 4.3 light years, which means that its light, traveling 186,000 miles every second, takes 4.3 years to get to us. Alpha Centauri is a system composed of several bodies—actually the one that is closest, called Proxima Centauri, is not the one that is visible from appropriate latitudes, since it cannot be seen with the naked eye.

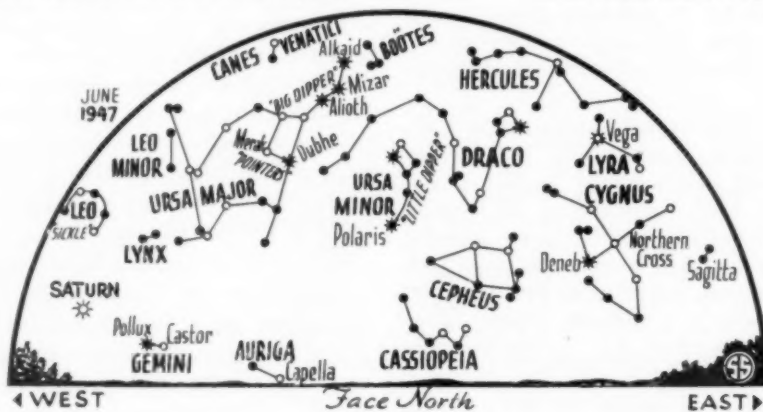
Close to this star is the Southern Cross, and it is visible from the same latitudes. In fact, the cross was originally part of the Centaur, marking his hind legs, but years ago it was made into a separate constellation. Though it contains brighter stars, it is not nearly as perfect a cross as our "Northern Cross," which forms part of Cygnus, with Deneb at the top of the cross.

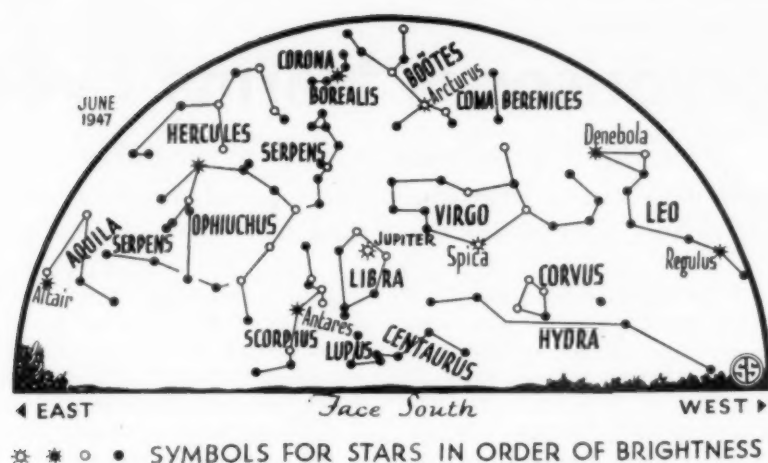
## Celestial Time Table for June

June	EST	
1	7:05 p.m.	Moon passes very close to Jupiter
3	2:27 p.m.	Full moon — partial eclipse of moon visible from eastern hemisphere
6	4:00 p.m.	Moon farthest — distance 252,200 miles
11	5:58 p.m.	Moon in last quarter
16	3:26 a.m.	Moon passes Mars
17	4:40 a.m.	Moon passes Saturn
18	6:00 a.m.	Mercury farthest east of sun
18	4:26 p.m.	New moon
19	9:00 a.m.	Moon nearest, 222,500 miles
21	6:28 a.m.	Moon passes Saturn
22	1:19 a.m.	Sun farthest north, summer commences
25	7:25 a.m.	Moon in first quarter
28	8:11 p.m.	Moon passes close to Jupiter

Subtract one hour for CST, two hours for MST, and three for PST.  
Add one hour for the corresponding Daylight Saving Time.

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## AERONAUTICS

## English At All Airports

American pilots will be able to speak English with all airports if they do not know the country's language. French and Spanish will be secondary language here.

➤ AMERICAN pilots can converse in English by radio with any airport in the world, the International Scientific Radio Union and the Institute of Radio Engineers were told by Howard K. Morgan, Bendix Aviation Corporation, Baltimore. Those of us who speak English are in a very fortunate position, he said.

This is due to recent international agreements. With airports in non-English-speaking countries, their own language is primary but English is designated as a secondary language for use with approaching pilots who can not talk the local tongue. In English-speaking countries, French or Spanish is the secondary language, depending upon in what part of the world the country is located.

Voice instructions by radio from airports in countries whose local language means nothing to pilots from other parts of the world presented a serious problem in traffic control in international flying. It was just one of the many problems, however. Others include use of similar instruments in traveling and particularly in making landings in bad weather.

Many hundreds of air navigation and traffic control devices have been developed, Mr. Morgan stated. A number of these were selected at the recent Montreal meeting of the Provisional International Civil Aviation Organization

(PICAQ) as most desirable. Some of these were described by him.

There is universal agreement, he said, that very high frequency (VHF) radio telephone is the primary aid in the airport zone, and in the enroute-short-distance zone. Bartow lights, of great brilliancy, and fog-dispersal equipment are generally agreed upon as necessary aids in foggy weather. The latter is a method of lifting fogs by means of long lines of burning fuel stretching along runways.

The instrument landing system developed in the United States prior to the war, and improved later, has met with international agreement. This is the so-called three-element system installed at various American airports by the Civil Aeronautics Administration. It has a radiowave localizer to guide planes to the runway, a glide path for proper rate of descent, and radio fan markers on the approach path to indicate distances from the landing strip.

Scanning radar at all ports to detect approaching planes in overcast weather is a necessity for the traffic control operator, he declared. It should be separated from the radar ground control approach apparatus, known as GCA, and mounted at a more advantageous position. Thus GCA would be used for the precision functions during final approach and landing. GCA is the system

by which pilots are "talked down" by radio instructions by ground operators following the plane on radar scopes.

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## MEDICINE

## Needling Cures Sprained Ankles Without Taping

➤ SPRAINED ANKLES, knees, wrists and thumbs can be cured by simply needling the joint. No drugs, taping or bandaging are required.

This finding, which confirms a 2000-year-old Chinese treatment for relief of pain in sprains, was announced by Janet Travell and Audrie L. Bobb of Cornell Medical College at the meeting in Chicago of the Federation of American Societies for Experimental Biology.

Injection of a local anesthetic, novocaine, into the painful joint has become the modern treatment for sprained ankles, wrists, and the like. But in four out of six cases of acute sprains, the Cornell scientists gave the patients complete and permanent relief of pain and disability by injecting a salt solution. In one case "dry needling" alone, that is, injecting the needle but no solution, gave relief.

This dispels the idea that the pain-killing effect of the local anesthetic was what produced the cures of sprained ankles, but leaves scientists with something of a puzzle.

Likeliest explanation, the Cornell scientists say, is that the persistent pain following a sprain is due to pressure by fluid which accumulates within the ligament structures. The pressure is mechanically released when the needle punctures deposits of fluid within the injured tissues.

*Science News Letter, May 31, 1947*

## INVENTION

## Vitamin Adding Machine Shows Number of Units

➤ AN ADDING machine for vitamins is the subject of patent 2,420,762, taken out by G. W. Torrence of Peoria, Ill. It consists of a series of superimposed disks turning on a common axis, with names of foods and numerical values for their vitamins opposite them. When you have turned the dials to line up an appetizing meal, you can read off at once the number of vitamin units you'll get.

*Science News Letter, May 31, 1947*



## Do You Know?

Garden *mulch* is best applied after the soil is thoroughly warmed.

One pair of *silk* stockings may require as much as 50 miles of fine filament silk.

Modern *match* heads contain ingredients which rats and mice will not touch, even when starving.

Mules like *bananas* so much that nosebags are used on the animals when working around the fruit.

Volcanic *ash* in Oklahoma has been successfully used to make a light-weight building material suitable for insulation.

The 169 national *parks* and *monuments* in the United States include within their outer boundaries some 600,000 acres in state or private ownership over which the government has no control.

*Cigar ashes* contain lime, potash, and small quantities of phosphorus, manganese, magnesium and other valuable plant foods; they are a well balanced fertilizer except for the lack of nitrogen.

The importance of *chemistry* in modern life is evidenced by the fact that some 52,000 chemists, chemical engineers and others interested in this subject are now enrolled in the American Chemical Society.

In pasteurizing *milk*, a process now generally practiced which took the name from the noted Pasteur, the temperature is held at 143 degrees Fahrenheit for 30 minutes, or at 160 degrees for 15 seconds, then rapidly cooled.

### MAGNIFIER

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### OPHTHALMOLOGY-PsYCHIATRY

## Nervousness Harms Eyes

Prolonged disturbances due to unstable nervous systems may cause blurring of vision and permanent damage to retina. Symptoms are listed.

► PERMANENT damage to the eyes, in the form of blurring of vision and a tiny hole at the center of the retina, can be caused by prolonged psychological disturbances.

This is reported by Dr. David O. Harrington, University of California Medical School ophthalmologist, in the *American Journal of Ophthalmology*.

Both this type of permanent injury and similar temporary conditions are caused in young persons with inherited unstable sympathetic nervous systems, Dr. Harrington said. Such cases turned up in great numbers in both services during the war, and they are also to be found in young civilians of unstable temperament.

The psychologically induced ocular changes are caused by the action of emotional disturbances in causing a severe involuntary contraction of blood vessels in various parts of the body. In persons with weak autonomic nervous systems this contraction may cause marked changes in the retina or sensitive nerve layer at the back of the eye. If the disturbance is shortlived these retinal changes may be only temporary, but if it lasts for any length of time the damage may be permanent, Dr. Harrington said.

The same ocular damage may be caused in persons with over-sensitive nervous systems by any stimuli such as exposure to extremes of temperature, too much cigarette smoking, infection, severe pain, dehydration induced by prolonged periods of strenuous muscular exertion, and fatigue approaching exhaustion.

Headache, transient dizziness, blurring of vision lasting from a few seconds to 10 minutes and varying from a slight "film" over the eyes to complete "black-out" are symptoms of the temporary condition.

Dr. Harrington described the typical subject of such attacks as young, underweight, nervous, poor sleeper, frequently a chain smoker, and often a sufferer of true anxiety neurosis. He often has cold, wet, clammy hands and feet regardless of climatic conditions.

Sweating of extremities is associated

with the diminished blood supply resulting from the conditions of the blood vessels caused by severe emotional disturbances. Raynaud's disease, in which insufficient circulation brings on dry gangrene of the fingers and toes, may result in the more severe cases.

The temporary condition is "seen in young adolescents of somewhat unstable temperament, who manifest periodic 'blackout' under conditions of excitement, homesickness, worry, and the emotional shock of battle," the physician writes.

"Every medical officer in the armed forces has seen them in great numbers, and I have frequently seen them in civilian life in anxious medical students before an important examination.

"In those cases in which the emotional disturbance is severe or prolonged a permanent blurring of vision in one or both eyes may occur. This is associated with a dull pain in or behind the eyes; a tiny blind spot in the center of the field of vision and a distortion of objects. In these cases the eye specialist may actually see a tiny hole in the center of the retina and this hole is permanent."

*Science News Letter, May 31, 1947*

### PSYCHOLOGY

## Pilots of Future May "See" Sound

► IN THE FUTURE you may be able to "see" sound. What you hear may tell you where a thing is or what it looks like.

A series of buzzes, boops and swoops of sound may give the pilot of an airplane coming into an airport an illusion of a line drawn across the sky. This arrow painted in sound will point directly to his landing field.

This possibility is visualized by Dr. Clifford T. Morgan of the psychological laboratories at the Johns Hopkins University. It is one of the developments which he foresees from an extensive research program for the U. S. Navy Department. Dr. Morgan calls the program "long-haired, pure research on sounds."

Experiments are being conducted with different kinds of noises to discover

which ones are most easily heard and most easily distinguished from one another. How easy, for example, is it to tell one very short burst of sound from another of a different pitch? How many different kinds of complicated sound can

be invented? Which kinds of noise are best to use for signaling?

These and many others are only questions. The answers will have practical applications in the noisy world of tomorrow.

*Science News Letter, May 31, 1947*

## PSYCHOLOGY

## Solving Your Problems

► **HOW YOU SOLVE** your personal problems tells what kind of personality you have. This new way to size yourself up and sort out your friends was proposed to the Midwestern Psychological Association meeting in Chicago by Prof. Robert H. Seashore, of Northwestern University.

It is a better way to pigeonhole individuals than the old way of sorting them into go-getters or solitary thinkers. It would serve psychiatrists better than the classical medical division into schizophrenic, manic-depressive, and paranoid.

Everybody, at one time or another, uses all these ways of tackling problems. Which one is your favorite?

**Direct attack.** The person who goes straight at the trouble, working all the harder, or improving his technique when things are too difficult.

**Going around.** This man dodges obstacles and tries a new approach when one method doesn't seem to work.

**Escape.** He ignores problems or stalls for time until something happens to relieve him of the problem.

**Diversion.** He throws up a smoke screen in the form of a temper tantrum to distract attention from the main issue.

**"Sour grapes."** This man pretends to himself and others that the question wasn't very important anyway—that he never really wanted to solve it.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★

## WYOMING

Yes, even **THIS** summer you may fish in its mountain streams, ride horseback through its hills and canyons, find Indian relics and marine fossils in a region of great historical and geologic interest.

The Patons welcome a limited number of guests at their ranch in the Big Horn country. They offer plenty of ranch grown food, comfortable cabins and gentle horses. May they tell you more? Write:

**Paton Ranch, Shell, Wyoming**

**"Basking."** He hangs around with successful people so that he will get credit for their bright ideas.

**"Passing the buck."** He blames failures on other people or circumstances.

**Spotlight seeking.** When he can't succeed, he tries to get attention, even if it is unfavorable because it is better than being ignored.

**Giving up.** He acts childish or plays sick in order that people will not expect him to solve the problem.

**Forgetting.**

**Daydreaming.** He ignores real problems while he dreams of imaginary successes.

*Science News Letter, May 31, 1947*

## PHYSICS

## Tiny New Battery Cell Has Low Temperature Efficiency

► **TINY ELECTRIC** batteries, developed for war uses, may find many applications in civilian life because of their small size, efficiency at low temperatures, and the comparative ease with which they can be prepared. In its present form, however, this cell has definite limitations, one of which is that the acid used is dangerous to handle.

It is the perchloric acid primary cell, with lead, lead dioxide, and perchloric acid as its active materials. One of its principal war uses was in radiosonde equipment, which was sent high into the atmosphere by small balloons to report weather conditions automatically by radio code.

The preparation of these batteries was described to the Electrochemical Society meeting in Louisville, Ky., by J. C. White, Naval Research Laboratory, Washington, D. C., and former associates, W. H. Power, R. L. McMurtrie and R. T. Pierce, Jr. The cell was developed at the National Bureau of Standards by J. P. Schrodt, D. N. Craig and G. W. Vinal.

This electric cell contains plated lead dioxide positive plates, metallic lead neg-

ative plates, and aqueous perchloric acid electrolyte. The soluble nature of the discharge product, lead perchlorate, permits relatively high currents to be drawn from the cell at temperatures as low as 20 degrees below zero Centigrade.

The perchloric acid primary cell can be easily prepared without the use of special apparatus or techniques. Lead oxide can be readily plated on nickel screen for the positive plate, and lead sheet or a lead-plated grid make good negative materials.

The cell in its present form has limitations for general use. No material for the positive side of the cell, other than the precious metals, has been found which will resist attack in contact with perchloric acid and lead dioxide for more than a few days. Cells using nickel grids must not be filled with acid until immediately before discharge. The dry battery in storage should last indefinitely, however.

*Science News Letter, May 31, 1947*

Paper *washcloths* are increasingly used in American hotels; they are satisfactory, and no laundering expense is involved.

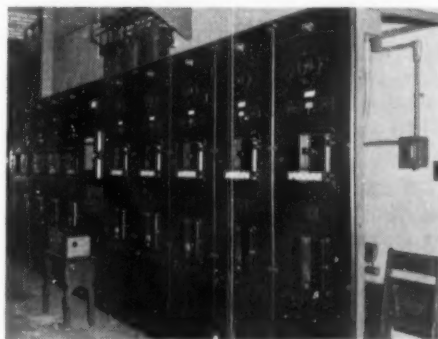


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### From Many Lands

► ALL QUARTERS of the globe meet at the crossroads of our garden paths. Contributions from the Old World predominate, for we are after all transplanted Europeans, but the Americas make substantial offerings as well.

The triad that every home gardener sets out, no matter how tiny his plot—lettuce, radishes, and onions—all seem to have started somewhere near the eastern end of the Mediterranean. At any rate, they were there at the dawn of history, for we find them mentioned in ancient Egyptian inscriptions. There is one document about the earliest strike on record: laborers in some pharaoh's monumental project refused to go back to work until they got more radishes and onions to eat with their bread.

Cabbage is European, from the chalk cliffs of England, and across the North Sea in Denmark and the Low Countries. Wild cabbage still grows in these places; though you would hardly recognize the little, open rosette of leaves as ancestral to the tight round heads we harvest—or hope to, anyway. The cabbage-head is really an exaggerated central leaf-bud.

Carrots and beets are of Eurasian origin also. Although carrots have run wild

in this country as a weed (Queen's lace), beets have shown no tendency to do so. Peas, too, are from the Old World, as are cucumbers and cantaloupes. Watermelons are African in origin.

New World vegetables include potatoes, tomatoes, green peppers, pumpkins, most squashes, and all beans except the little-used Windsor or broad bean and the table soybean which is just coming into real popularity. Sweetcorn, too, is American, though the Indians made little use of it before the arrival of white men.

Some of these American vegetables reached our gardens by roundabout paths. Potatoes, for example, were carried to continental Europe from South America, thence to England and Ireland, from there to Bermuda, and finally to the colony of Virginia.

You may smoke while you cultivate your garden. You may also use a nicotine spray to combat certain insect pests. In either, you are making use of another American plant: tobacco was used by most of the Indians of both continents when Columbus landed, and was not known before then in other parts of the world.

*Science News Letter, May 31, 1947*

### PHOTOGRAPHY

## Lens Changes Instantly From Long to Close Shots

► LONG SHOTS and close-ups will cause motion picture camera operators no trouble in the future, thanks to a new lens that makes it possible to instantly change from one to the other. The lens is not yet ready for production, but will be soon. A version of it for television is perfected and has already been demonstrated.

The type demonstrated is the Fairbanks television lens developed for Jerry Fairbanks, Inc., by Dr. Frank G. Back. Called also the Zoomar lens, it was recently given tests in the laboratories of the National Broadcasting Company in New York. It gives increased efficiency and flexibility, it is claimed.

The motion picture lens, which should be completed in six months, is a more compact version of the Zoomar lens than the television type. It is for use in the 35-millimeter field, either in the studio or in the open in taking newsreels. It gives the newsreel unlimited scope. Any event can be photographed with one camera without interruption as the cameraman regulates the lens for the proper focal ranges.

*Science News Letter, May 31, 1947*

### MEDICINE

## New Vitamin to Be Found Will Aid Anemia Victims

► A NEW VITAMIN is waiting to be discovered. It exists in liver and will help pernicious anemia victims. It might be called, when discovered, the anti-nerve-degeneration vitamin because its function would be to prevent the nerve degeneration that develops in some patients with pernicious anemia.

Existence of the vitamin is suggested by studies reported by Dr. Tom D. Spies of the University of Cincinnati and the Nutrition Clinic, Hillman Hospital, Birmingham, Ala., at the meeting in New York of the Spies Committee for Clinical Research.

Synthetic folic acid, newest member of the vitamin B family, acts as an important blood builder in many kinds of anemia, including pernicious anemia. It cannot, however, be counted on to protect against the nerve degeneration that sometimes develops in pernicious anemia. The condition begins with the feet and hands tingling and "going to sleep" and may go on until the patient is incapacitated or paralyzed if not treated. Adequate amounts of potent liver extract protect against it.

"These observations suggest there is another important nutrient awaiting discovery," Dr. Spies said. "Many anemia patients who become allergic to liver extract can be safely and securely treated with folic acid as long as they do not develop nerve degeneration."

The anemias of sprue, pellagra and pregnancy and nutritional macrocytic anemia are all helped by folic acid.

"It is amazing," Dr. Spies stated, "that patients with tropical sprue, who subsist on a diet composed almost entirely of starchy foods, regenerate (rebuild) blood when they are given folic acid even when they continue to eat such a diet."

*Science News Letter, May 31, 1947*

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# Books of the Week

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**ALL ABOUT US**—Eva Knox Evans—*Capitol Pub.*, 95 p., illus., \$2. This story of people helps children understand the role custom and environment play in understanding other nations.

**AMERICA'S NEEDS AND RESOURCES**—J. Frederick Dewhurst and assoc.—*Twentieth Century Fund*, 812 p., \$5. A survey of America's achievement in wartime and peacetime production with estimates for the future shows the trend toward increased productivity as the result of expanding use of machines and inanimate energy. The resultant benefits are more consumer goods and shorter work weeks.

**AMERICA'S STAKE IN WORLD TRADE**—Gloria Waldron and Norman S. Buchanan—*Public Affairs Committee*, Pamphlet No. 130, 32 p., paper, illus., 20 cents. Covers the relation of trade to world economy.

**BIBLIOGRAPHY ON SCIENTIFIC PERSONNEL AND ITS RELATION TO THE CONDUCT OF RESEARCH IN GOVERNMENT, INDUSTRY, AND UNIVERSITIES**—Scientific Personnel Branch—*Office of Naval Research*, Info. Series 4, SPB Series 16, 22 p., paper, free. Assembled from books, pamphlets, magazine articles, and legislative items, this compilation is intended for personnel officers, operating officials, and scientists.

**BUSINESS MATHEMATICS: PRINCIPLES AND PRACTISE**—R. Robert Rosenberg—*Gregg Pub.*, 3rd ed., 568 p., \$1.84. A text for vocational courses in business arithmetic covering fundamental principles.

**CHEMISTRY AND METHODS OF ENZYMES**—James B. Sumner and G. Fred Somers—*Academic Press*, 2nd ed. rev., 415 p., illus., \$6.50. A survey of enzymes for the research worker and advanced student.

**CYCLES: THE SCIENCE OF PREDICTION**—Edward R. Dewey and Edwin F. Dakin—*Holt*, 255 p., \$3. With numerous graphs, the authors show trends in many fields over long and short periods of time. They imply that by investigating these, undesirable trends may be prevented.

**THE CONSUMER'S ECONOMIC LIFE**—Jessie Graham and Lloyd L. Jones—*Gregg Pub.*, 555 p., illus., \$1.92. For secondary schools, a text to help the student plan intelligently the selection, purchase and use of goods and services.

**THE ECHINODERM FAUNA OF AUSTRALIA; Its Composition and Its Origin**—Hubert Lyman Clark—*Carnegie Inst.*, Publ. 566, 567 p., paper, \$4; cloth, \$4.50. Divided into two parts, this survey includes an annotated list of both fossil and recent echinoderms and their interrelationships.

**ELECTRICITY: Principles, Practise Experiments**—Charles S. Siskind—*McGraw-Hill*, 448 p., illus., \$2.60. A text for senior high schools and junior colleges, this presentation of the general principles of direct and alternating current electricity shows how these principles apply to the more common circuits and how they may be experimentally verified.

**FIBER TO FABRIC**—M. D. Potter—*Gregg Pub.*, 314 p., illus., \$2. For students, consumers, and anyone engaged in merchan-

dising, this survey of the field of textiles, through differential qualities of fibers, preparation of yarn, and dyeing, should prove helpful.

**THE FUTURE OF TELEVISION**—Orrin E. Dunlap, Jr.—*Harper*, rev. ed., 194 p., illus., \$3. A popular discussion of this new industry and its future development and service.

**IN SEARCH OF BEAUTY IN MUSIC**—Carl E. Seashore—*Ronald Press*, 389 p., \$4.50. This scientific approach to musical esthetics outlines the present instrumental aids for improving teaching and performance, and postulates for the future many innovations.

**THE MARINE ALGAE OF THE COOS BAY-CAPE ARAGO REGION OF OREGON**—Ethel I. Sanborn and Maxwell S. Doty—*Oregon State College*, 66 p., illus., paper, 75 cents.

**POWER FACTOR IN YOUR PLANT**—W. C. King—*Cornell-Dubilier Elec. Corp.*, 214 p., illus., \$3. A non-technical discussion of this ratio and its importance in operating efficiency of plant equipment. Written for maintenance men, it is intensely practical.

**PRIMER FOR HOME BUILDERS**—Allen Carpenter, Norman Guess and ed. of *Popular Mechanics*—*Windsor Press*, 171 p., \$2.50. Designed to help the inexperienced understand what is involved in building a house so that he will get a good proportion of the things he wants and be able to pay the bills too.

**REPTILES AND AMPHIBIANS OF THE NORTHWESTERN STATES**—Roger Conant *Zoological Soc. of Phila.*, 40 p., illus., paper, \$1. Description and illustrations of all species of snakes, lizards, turtles, frogs, toads, and salamanders of the 11 states from Maine to Maryland.

**THIS IS OUR LAND: The Story of Conservation in the United States**—E. G. Cheyney and T. Schantz-Hansen—*Webb*, 344 p., illus., \$3. A history of the resources of our country and measures necessary to protect them.

**VIRUSES AND VIRUS DISEASES OF PLANTS**—Melville T. Cook—*Burgess*, 244 p., illus., paper, \$4. For plant pathologists, botanists and graduate students, this compilation will prove invaluable; both subject and author index included an exhaustive bibliography.

**WHO'S WHO IN LATIN AMERICA: PART IV: BOLIVIA, CHILE, AND PERU**—Ronald Hilton, ed.—*Stanford Univ. Press*, 3rd ed. rev., 209 p., \$2.50.

*Science News Letter, May 31, 1947*

## PSYCHOLOGY

### Brain Waves Show Students Should Study Longer Hours

► **BRAIN WAVES** spell bad news for students who complain of brain fog at the end of an eight-hour class day.

The eight-hour day does not produce

severe mental fatigue and should be lengthened, Drs. T. C. Barnes and Marie D. Amoroso, of Hahneman Medical College, Philadelphia, reported to the Federation of American Societies for Experimental Biology meeting in Chicago.

Students' brain wave records at eight a.m. and five p.m. told the story. Alpha waves, which disappear when persons are tired out, were still present in the students' five p.m. records.

*Science News Letter, May 31, 1947*

## CHEMISTRY

### Sulfuric Acid Sludge Used In Phosphate Production

► **FOOD PRODUCTION** calls for fertilizer, and among fertilizers phosphate is one of the most important. Unusual interest therefore attaches to a newly patented process in which sulfuric acid sludge, a waste product in oil refining, is used instead of new sulfuric acid in treating ground phosphate rock to produce superphosphate fertilizer.

In the method now in use, a mixture of phosphate rock and sulfuric acid is left for a time in "dens", while the gases caused by the acid's action froth up and lighten the product. Even so, it takes stiff digging, sometimes blasting, to get it out for sacking and shipping.

By using the sulfuric acid sludge, claims John Stauffer, Jr., of Los Angeles, originator of the process, the mixture in the dens foams up more thoroughly, due partly to the evaporation of the residual hydrocarbons in the sludge, and when the finished fertilizer has dried out it is already in powder form, ready to flow down chutes into the bags.

U. S. patent 2,418,203 has just been issued on this process.

*Science News Letter, May 31, 1947*

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⚙️ **AWNING PAINT**, an improved type in a dozen colors, makes faded canvas look like new. It leaves the fabric flexible, is sun-resistant, water-repellent and easily applied. It also gives protection against rot and mildew. The same paint is suitable for canvas lawn chairs.

Science News Letter, May 31, 1947

⚙️ **SLIDE RULE** for druggists is a direct reading calculator for weights and measures, temperature and formula conversions. Made of plastic, it is easily cleaned. It is suitable for chemists, photographers and other laboratory workers.

Science News Letter, May 31, 1947

⚙️ **SPIRIT LEVEL**, about one foot long, for carpenters and other workers, is made of a transparent plastic with seven small spirit tubes to indicate various angles. The center tube is used for leveling. The others are for six different angles, the degree of each being molded into the plastic.

Science News Letter, May 31, 1947

⚙️ **MINNOW BUCKET** for fishermen keeps the bait alive in constantly changing water. It is a double-cylinder device, with an inner container for the fish, and it floats as shown in the picture. When floating, water enters between the inner



and outer walls, and into the fish chamber through holes near the top.

Science News Letter, May 31, 1947

⚙️ **THREE-BAND** portable radio, for use in pleasure boats or airplanes, provides air and marine communications reception and regular radio programs. It can be used as an aid when navigating on aviation range stations, marine radio

beacons and broadcast stations. The radio is battery or generator-powered.

Science News Letter, May 31, 1947

⚙️ **STEEL** measuring tape has a case flattened on one edge for easy standing, and a plastic window on the curved opposite side through which the tape is read. A cross hairline makes reading easier. When the tape is completely rolled, the hairline reading is two inches, which is also the length of the base of the case.

Science News Letter, May 31, 1947

⚙️ **COLLAPSIBLE** hanger can be slipped into or out of a dress or blouse without unbuttoning the garment. One arm of the plastic device is hinged and can be extended or folded up by the flick of a trigger.

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## Question Box

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